This document provides pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a 0.0395 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia Water Quality Standards (effective 6 January 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained within this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1.	Facility Name and Mailing Address:	South Creek – Zion Crossroads STP 11 Perryville Court Staunton, VA 24401	SIC Code:	4952 WWTP
	Facility Location:	11445 James Madison Highway Gordonsville, VA 22942	County:	Louisa
	Facility Contact Name:	Fred Kaspick / Contract Operator	Telephone Number:	540-416-4581
	Facility Email Address:	fred@kaspick.net		
2.	Permit No.:	VA0088706	Expiration Date:	25 March 2015
	Other VPDES Permits:	Not Applicable		
	Other Permits:	Not Applicable		
	E2/E3/E4 Status:	Not Applicable		
3.	Owner Name:	South Creek Farms, LLC / GW & FW Holdings, LLC (Tenants in Common)		
	Owner Contact / Title:	Kay Jeffries / Trustee for F.F. White, II South Creek Farms, LLC	Telephone Number:	434-581-3892
	Owner Email Address:	2kaysgarden@gmail.com		
4.	Application Complete Date:	25 August 2014		
	Permit Drafted By:	Douglas Frasier	Date Drafted:	9 September 2014
	Draft Permit Reviewed By:	Joan Crowther	Date Reviewed:	11 September 2014
	Draft Permit Review By:	Alison Thompson	Date Reviewed:	29 September 2014
	Public Comment Period:	Start Date: TBD 2014	End Date:	TBD 2014
5.	Receiving Waters Information:	See **Attachment 1** for the Flow Frequency Determination.*		
	Receiving Stream Name:	Central Branch	Stream Code:	8-CEN
	Drainage Area at Outfall:	0.16 square miles	River Mile:	3.1
	Stream Basin:	York River	Subbasin:	None
	Section:	3	Stream Class:	III
	Special Standards:	None	Waterbody ID:	VAN-F01R
	7Q10 Low Flow:	0.0 MGD	7Q10 High Flow:	0.0 MGD
	1Q10 Low Flow:	0.0 MGD	1Q10 High Flow:	0.0 MGD
	30Q10 Low Flow:	0.0 MGD	30Q10 High Flow:	0.0 MGD
	Harmonic Mean Flow:	0.0 MGD	30Q5 Flow:	0.0 MGD

*Due to the small drainage area, it is staff's best professional judgement that the critical instream flows are essentially zero.

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

X	State Water Control Law		EPA Guidelines
X	Clean Water Act	X	Water Quality Standards
X	VPDES Permit Regulation	X	Other: Chesapeake Bay Watershed Implementation Plan (WIP)
X	EPA NPDES Regulation		

7. **Licensed Operator Requirements:** Class IV

8. **Reliability Class:** Class II

9. **Facility / Permit Characterization:**

X	Private	X	Effluent Limited		Possible Interstate Effect
	Federal	X	Water Quality Limited		Compliance Schedule
	State		Whole Effluent Toxicity Program		Interim Limits in Permit
	POTW		Pretreatment Program		Interim Limits in Other Document
X	eDMR Participant	X	Total Maximum Daily Load (TMDL)		

10. **Wastewater Sources and Treatment Description:**

This facility is a privately owned sewage treatment system which serves two (2) convenience stores/gas stations and a dialysis medical center. The treatment system has a design flow of 0.0395 MGD.

The facility consists of a lined LEMNA system which utilizes duckweed and diffused aeration to provide biological treatment and nitrification. The system includes an additional storage lagoon and an underdrain pump system to manage groundwater seepage under the liner. Final treatment includes post aeration and ultraviolet (UV) disinfection prior to discharging into Central Branch.

The facility is staffed through in-house operators. Operators are on site daily during discharges and approximately 1-1½ hours weekly during periods of no discharge. The facility typically discharges only twice per year (spring and fall) due to the storage capacity of the lagoon. The average duration of the discharge is 30 – 40 days.

No medical waste is received at the treatment system; all medical waste generated at the dialysis center is collected and transported weekly to an authorized medical waste disposal facility. Grease traps serving the convenience stores are pumped and hauled regularly by Valley Proteins.

See **Attachment 2** for a facility schematic/diagram. See Section 26 of the Fact Sheet also.

TABLE 1
OUTFALL DESCRIPTION

Number	Discharge Sources	Treatment	Design Flow	Latitude / Longitude
001	Domestic and commercial wastewater	See Section 10	0.0395 MGD	37° 58′ 22″ / 78° 12′ 37″

See **Attachment 3** for the Zion Crossroads topographic map. See Section 26 of the Fact Sheet also.

11. **Sludge Treatment and Disposal Methods:**

Due to the storage capacity of the treatment lagoon, there has been no need for sludge removal since it was placed into operation in 1997. Sludge depth is monitored on a regular basis and it is not expected to impact effluent concentrations until the sludge reaches a level of 1.5 feet.

The operator does not anticipate the need for any sludge removal within the next five (5) years. Sludge depths will continue to be monitored on an annual basis. If the sludge level begins to approach the above stated depth, the operator will submit a sludge removal and disposal plan for approval prior to implementation.

Note: the Louisa County Water Authority continues to expand its sanitary sewer service area and it is anticipated that customers/connections currently served by this system will be lost, as one connection has already connected to public service. At that time, the permittee will submit a closure plan to DEQ-NRO for review and approval.

12. Permitted Discharges Located Within Waterbody VAN-F01R:

TABLE 2 PERMITTED DISCHARGES			
Permit Number	Facility Name	Type	Receiving Stream
VA0021105	Gordonsville STP	Municipal Discharge Individual Permits	South Anna River, UT
VA0090743	Zion Crossroads WWTP		Camp Creek Lake
VA0087033	Dominion – Gordonsville Power Station	Industrial Discharge Individual Permits	South Anna River
VA0091332	Old Dominion Electric Cooperative – Louisa		Happy Creek, UT
VAR050848	Klockner Pentaplast of America Inc. – Gordonsville	Stormwater Industrial Discharge General Permits	South Anna River, UT
VAR050969	Columbia Forest Products – Gordonsville Log Yard		South Anna River, UT
VAG406474	East End Farm	Domestic Discharge ≤ 1,000 gpd General Permits	Hudson Creek, UT
VAG406455	Seymour Property		South Anna River, UT
VAG406049	Annadale Land Trust Residence		South Anna River, UT
VAG406496	Nolting Residence		Fielding Creek, UT
VAR406484	Haney Residence		Bowles Creek, UT
VAG250135	Klockner Pentaplast of America	Cooling Water Discharge General Permit	South Anna River, UT

13. Material Storage:

There are no chemicals utilized or stored on site.

14. Site Inspection:

Compliance inspection was performed by DEQ-NRO staff on 24 July 2007. Refer to **Attachment 4** for the inspection report.

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

This facility discharges into Central Branch, which has not been monitored or assessed by DEQ. The nearest downstream DEQ monitoring station is 8-CMP000.28; located at the Route 717 bridge crossing. This station on Camp Creek is located approximately 4.8 miles downstream of Outfall 001. The following is the water quality summary for Camp Creek, as taken from the 2012 Integrated Report:

Class III, Section 3.

DEQ monitoring station located in this segment of Camp Creek: Ambient and biological monitoring station 8-CMP000.28 at Route 717.

E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. This impairment is nested within the downstream completed bacteria Total Maximum Daily Load (TMDL) for the South Anna River.

Biological monitoring finds benthic macroinvertebrate impairments, resulting in an impaired classification for the aquatic life use.

The fish consumption and wildlife uses were not assessed.

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 3 INFORMATION ON DOWNSTREAM 303(d) IMPAIRMENTS AND TMDLs					
Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA
Impairment Information in the 2012 Integrated Report					
Camp Creek	Recreation	*E. coli*	Pamunkey River Basin Bacteria TMDL 2 August 2006	6.87E+10 cfu/year *E. coli*	126 cfu/100ml *E. coli* --- 0.0395 MGD
	Aquatic Life	Benthic Macroinvertebrates	2024	---	---

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal. The 2012 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment. EPA issued the Bay TMDL on 29 December 2010. It was based, in part, on the Watershed Implementation Plans developed by the Bay watershed states and the District of Columbia.

The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories [wastewater, urban storm water, onsite/septic agriculture, air deposition]. Fact Sheet Section 17.e provides additional information on specific nutrient monitoring for this facility to verify the aggregate assumptions of the Chesapeake Bay TMDL.

The planning statement is found in **Attachment 5**.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, Central Branch, is located within Section 3 of the York River Basin and classified as Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32° C and maintain a pH of 6.0 – 9.0 standard units (S.U.).

The Freshwater Water Quality Criteria / Wasteload Allocation Analysis located in **Attachment 6** details other water quality criteria applicable to the receiving stream. Some Water Quality Criteria are dependent on the pH, temperature and total hardness of the receiving stream and/or final effluent. These values were utilized to determine the criterion for the following pollutants:

pH and Temperature for Ammonia Criteria

The fresh water, aquatic life Water Quality Criteria for ammonia is dependent on the instream pH and temperature. Since the effluent may have an impact on the instream values, the pH and temperature values of the effluent must also be considered when determining the ammonia criteria for the receiving stream. The 90th percentile pH and temperature values are utilized because they best represent the critical conditions of the receiving stream.

The critical 30Q10 and 1Q10 flows of the receiving stream have been determined to be 0.0 MGD; thus, there is no available pH and temperature data. In cases such as this, effluent pH and temperature data may be utilized to establish the ammonia water quality criteria. See **Attachment 7** for the derivation of the 90th percentile values of the effluent pH data from May 2010 to June 2014. A default temperature value of 25° C and an assumed temperature value of 15° C for summer and winter, respectively, were utilized since effluent temperature data was not readily available.

The ammonia water quality criteria calculations are shown in **Attachment 6**.

Hardness Dependent Metals Criteria

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent total hardness values (expressed as mg/L calcium carbonate). There is no hardness data for this effluent or the receiving stream. Staff guidance suggests utilizing a default hardness value of 50 mg/L $CaCO_3$ for streams east of the Blue Ridge.

The hardness dependent metals criteria in **Attachment 6** are based on this default value.

Bacteria Criteria

The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli bacteria per 100 mL of water shall not exceed the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 mL)	126

[1]For a minimum of four weekly samples taken during any calendar month

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Central Branch, is located within Section 3 of the York River Basin. This section has not been designated with a special standard.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

It is staff's best professional judgement that the receiving stream be classified as Tier 1 based on the following: (1) the stream critical flows have been determined to be zero; and (2) at times the stream flow may be comprised of only effluent.

The proposed permit limits have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLAs) are calculated. In this case since the critical 7Q10, 1Q10 and 30Q10 flows have been determined to be zero, the WLAs are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. In the case of ammonia evaluations, limits are needed if the 97th percentile of the thirty-day average effluent concentration value is greater than the chronic WLA.

Effluent limitations are based on the most limiting WLA, the required sampling frequency and statistical characteristics of the effluent data.

a. Effluent Screening

Effluent data obtained from the permit application and April 2010 – June 2014 Discharge Monitoring Reports (DMRs) have been reviewed and determined to be suitable for evaluation.

Please see **Attachment 7** for a summary of effluent data. As a reminder, this facility only discharges two to three times a year; yielding limited effluent data.

The following pollutant requires a wasteload allocation analysis: ammonia, since this is a facility treating domestic sewage.

b. Mixing Zones and Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o[Q_e + (f)(Q_s)] - [(C_s)(f)(Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; 30Q10 for ammonia criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- C_s = Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 has been determined to have critical 7Q10, 1Q10 and 30Q10 flows of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the C_o.

c. Effluent Limitations, Outfall 001 – Toxic Pollutants

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N/TKN

Staff reevaluated effluent pH data to determine ammonia water quality criteria, wasteload allocations (WLAs) and subsequent ammonia limitations (**Attachment 8**). The toxicity of ammonia is dependent on the pH of the effluent and/or receiving stream. Ammonia can exist as both "ionized ammonia" (NH_4) and "un-ionized ammonia" (NH_3). Research has shown that the un-ionized ammonia is the fraction that is toxic to aquatic life while the ionized ammonia has been found to have little or no toxic effect. Furthermore, it has been demonstrated that the un-ionized fraction increases correspondingly with rising pH values; thus, increasing potential toxicity and the basis for the above calculated ammonia limits.

DEQ guidance suggests using a sole data point of 9.0 mg/L for discharges containing domestic sewage to ensure the evaluation adequately addresses the potential for ammonia to be present in the discharge. Since this is an intermittent discharge, only the acute criteria will be assessed per agency guidance.

The derived limitation of 3.88 mg/L is less stringent than the current 2.1 mg/L. Antibacksliding provisions do not allow relaxation of limitations based on revised water quality criteria. However, staff noted that the previously derived limit is actually 2.2 mg/L. The previous derivation is also located in **Attachment 8**. This will be corrected during this reissuance as this is allowed under the antibacksliding provisions based on discovered technical errors (9VAC25-31-220.L.2.b.(2)).

NOTE: The Environmental Protection Agency (EPA) finalized new, more stringent ammonia criteria in August 2013; possibly resulting in significant reductions in ammonia effluent limitations. It is staff's best professional judgement that incorporation of these criteria into the Virginia Water Quality Standards is forthcoming. This and many other facilities may be required to comply with these new criteria during their next respective permit terms.

2) Total Residual Chlorine (TRC)

Chlorine is not utilized for disinfection at this facility; therefore, limit derivation is not warranted.

3) Metals/Organics

It is staff's best professional judgement that given the wastewater sources; limitations are not warranted at this time.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), carbonaceous-biochemical oxygen demand-5 day ($cBOD_5$), total suspended solids (TSS), ammonia, as N and pH limitations are proposed.

Dissolved oxygen and $cBOD_5$ limitations are based on the stream modeling conducted in August 1994 (**Attachment 9**) and are set to maintain water quality standards in the dry ditch.

pH limitations are more stringent than the water quality criteria. The maximum value of 8.0 S.U. will protect against ammonia toxicity and ensures protection of the water quality. Refer to Section 17.c.1 for discussion.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

e. Effluent Monitoring Requirements, Outfall 001 – Nutrients

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Non-significant discharges located within the Chesapeake Bay watershed are subject to aggregate wasteload allocations for total nitrogen (TN), total phosphorus (TP) and sediments under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay. Monitoring for TN and TP during this permit term will be required in order to assess and verify the aggregate wasteload allocations.

f. Effluent Limitations and Monitoring Summary

The effluent limitations are presented in Section 19. Limits were established for carbonaceous-biochemical oxygen demand-5 day ($cBOD_5$), total suspended solids (TSS), ammonia as N, pH, dissolved oxygen (D.O.) and *E. coli*. The facility will also monitor for total nitrogen and total phosphorus as discussed previously in Section 17.e.

The limit for total suspended solids is based on Federal Effluent Standards for Secondary Treatment.

Monitoring requirements for total nitrogen and total phosphorus are based on Best Professional Judgement and current agency guidance for non-significant discharges located within the Chesapeake Bay Watershed.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and then a conversion factor of 3.785.

Sample types and frequencies are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for cBOD and TSS (or 65% for equivalent to secondary). The permittee collected influent samples for cBOD and TSS during the previous permit term. Staff reviewed the data and the results indicate that this facility is achieving > 85% removal. Therefore, it is staff's best professional judgement that influent monitoring on an annual basis not be included with this reissuance since the permittee has demonstrated the removal efficiency of this treatment works.

18. Antibacksliding:

The backsliding proposed with this reissuance conforms to the anti-backsliding provisions of Section 402(a)(1)(B) of the Clean Water Act, VPDES Permit Regulation 9VAC25-31-220.L.2.b.(2) and 40 § CFR 122.44. Staff, during previous reissuances, made a technical/typographical error in regards to the ammonia limitations. Refer to Section 17.c.1) for further details.

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19. Effluent Limitations/Monitoring Requirements:

Design flow is 0.0395 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D	Estimate
pH	2,3	NA	NA	6.0 S.U.	8.0 S.U.	1/D	Grab
$cBOD_5$	3,4	15 mg/L 2.2 kg/day	22 mg/L 3.3 kg/day	NA	NA	1/M	Grab
Total Suspended Solids (TSS) [a.]	1,2	30 mg/L 4.5 kg/day	45 mg/L 6.7 kg/day	NA	NA	1/M	Grab
Dissolved Oxygen (DO)	3,4	NA	NA	5.0 mg/L	NA	1/D	Grab
Ammonia, as N	3	2.2 mg/L	2.2 mg/L	NA	NA	1/M	Grab
E. coli (Geometric Mean) [b.]	3,5	126 n/100mL	NA	NA	NA	1/W	Grab
Total Kjeldahl Nitrogen (TKN)	2,6	NL mg/L	NA	NA	NA	1/Y	Grab
Nitrate+Nitrite, as N	2,6	NL mg/L	NA	NA	NA	1/Y	Grab
Total Nitrogen [c.]	2,6	NL mg/L	NA	NA	NA	1/Y	Calculated
Total Phosphorus	2,6	NL mg/L	NA	NA	NA	1/Y	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. Stream Model – **Attachment 9**
5. Pamunkey River Basin Bacteria TMDL
6. Chesapeake Bay TMDL/WIP

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/D = Once every day.
1/W = Once every week.
1/M = Once every month.
1/Y = Once every calendar year.

Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.
Grab = An individual sample collected over a period of time not to exceed 15 minutes.

a. TSS shall be expressed as two (2) significant figures.

b. Samples shall be collected between 10:00 a.m. and 4:00 p.m.

c. Total Nitrogen = Sum of TKN plus Nitrate+Nitrite

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20. Other Permit Requirements:

Part I.B. of the permit contains quantification levels and compliance reporting instructions

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an instream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

21. Other Special Conditions:

a. 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a PVOTW.

b. Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200.B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c. O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct (CTC) prior to commencing construction and to obtain a Certificate to Operate (CTO) prior to commencing operation of the treatment works.

e. Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200.C., and by the Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class IV operator.

f. Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet reliability Class II.

g. Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220.D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

h. Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

i. Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2, and 420 through 720 and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

j. Treatment Works Closure Plan. This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility is being replaced or is expected to close. This is necessary to ensure treatment works are properly closed so that the risk of untreated wastewater discharge, spills, leaks and exposure to raw materials is eliminated and water quality maintained. Section §62.1-44.21 requires every owner to furnish when requested plans, specification and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purpose of the State Water Control Law.

k. Nutrient Reopener. 9VAC25-40-70.A. authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390.A. authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

l. Total Maximum Daily Load (TMDL) Reopener. Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan or other wasteload allocation prepared under section 303 of the Act.

22. Permit Section Part II.

Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:

- The Lagoon Liner Integrity special condition was removed during this reissuance, as the permittee completed the conditions during the previous permit term. Results indicated no issues with the lagoon liner.
- The Nutrient Reopener was included with this reissuance.

b. Monitoring and Effluent Limitations:

- Monitoring for total nitrogen (includes TKN and nitrate+nitrite) and total phosphorus was included with this reissuance per current agency guidance. Information obtained will be utilized to reevaluate the WIP.
- Influent monitoring for cBOD and total suspended solids has been removed since the permittee completed the 85% removal verification during the previous permit term.
- The ammonia limitation was corrected with this reissuance. It was discovered that a transcription error occurred during previous reissuances and the limitation should be 2.2 mg/L, not 2.1 mg/L.

c. Other:

- The compliance schedule for the maximum pH limitation of 8.0 S.U. was removed with this reissuance. The deadline of 26 March 2011 has passed.
- The receiving stream was corrected during this reissuance. Planning staff ascertained that the discharge is directly to Central Branch, not an unnamed tributary.

24. Variances/Alternate Limits or Conditions:

The maximum pH limitation is more stringent than the water quality standards of 9.0 S.U. The limit of 8.0 S.U. is to ensure that the ammonia found in the discharge exists in a form not toxic to aquatic life.

25. Public Notice Information:

First Public Notice Date: TBD 2014 Second Public Notice Date: TBD 2014

Public Notice Information is required by 9VAC25-31-280.B. All pertinent information is on file and may be inspected and copied by contacting the: DEQ Northern Regional Office; 13901 Crown Court; Woodbridge, VA 22193; Telephone No. 703-583-3873, Douglas.Frasier@deq.virginia.gov. See **Attachment 10** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. Additional Comments:

Previous Board Action(s):	Not applicable.
Staff Comments:	This facility has changed names several times during previous permit terms and reissuances. Several of the Attachments may reference previous facility names but are still correct and relevant.
State/Federal Agency Comments:	Virginia Department of Health staff had no comment or objection to the permit action.
Public Comments:	No comments were received during the public notice.
Owner Comments:	

Fact Sheet Attachments

Table of Contents

South Creek – Zion Crossroads Sewage Treatment Plant
VA0088706
2015 Reissuance

ATTACHMENT 1

Flow Frequency Determination

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Office of Water Quality Assessments
629 East Main Street P.O. Box 10009 Richmond, Virginia 23219

SUBJECT: Flow Frequency Determination
Virginia Oil, Zion Crossroads – VA#0088706

TO: J.R. Pandey, VRO

FROM: Paul E. Herman, P.E., WQAP

DATE: March 26, 1999

COPIES: Ron Gregory, Charles Martin, File

The Virginia Oil – Zion Crossroads Facility discharges to an unnamed tributary of the Central Branch near Zion Crossroads, Virginia. Stream flow frequencies are required at this site for use by the permit writer in developing the VPDES permit.

The flow frequencies for the discharge receiving stream were determined by inspection of the USGS Zion Crossroads Quadrangle topographic map. The map depicts the receiving stream as an intermittent stream at the discharge point. The flow frequencies for intermittent streams are 0.0 cfs for the 1Q10, 7Q10, 30Q5, high flow 1Q10, high flow 7Q10, and harmonic mean. For modeling purposes, flow frequencies have been determined for the perennial Central Branch.

The VDEQ operated a continuous record gage on the Bunch Creek near Boswells Tavern, VA (#01671500) from 1949 to 1979. The gage was located 3.5 miles north of the discharge point, at the U.S. Route 15 bridge, in Louisa County, VA. The flow frequencies for the perennial point were determined using drainage area proportions and do not address any withdrawals, discharges, or springs that may lie upstream of the perennial point. The flow frequencies for the gage and the perennial point are presented below.

Bunch Creek near Boswells Tavern, VA (#01671500):

Drainage Area = 4.4 mi^2

1Q10 = 0.0 cfs	High Flow 1Q10 = 0.47 cfs
7Q10 = 0.0 cfs	High Flow 7Q10 = 0.60 cfs
30Q5 = 0.0 cfs	HM = 0.0 cfs

Central Branch at perennial point:

Drainage Area = 0.82 mi^2

1Q10 = 0.0 cfs	High Flow 1Q10 = 0.09 cfs
7Q10 = 0.0 cfs	High Flow 7Q10 = 0.11 cfs
30Q5 = 0.0 cfs	HM = 0.0 cfs

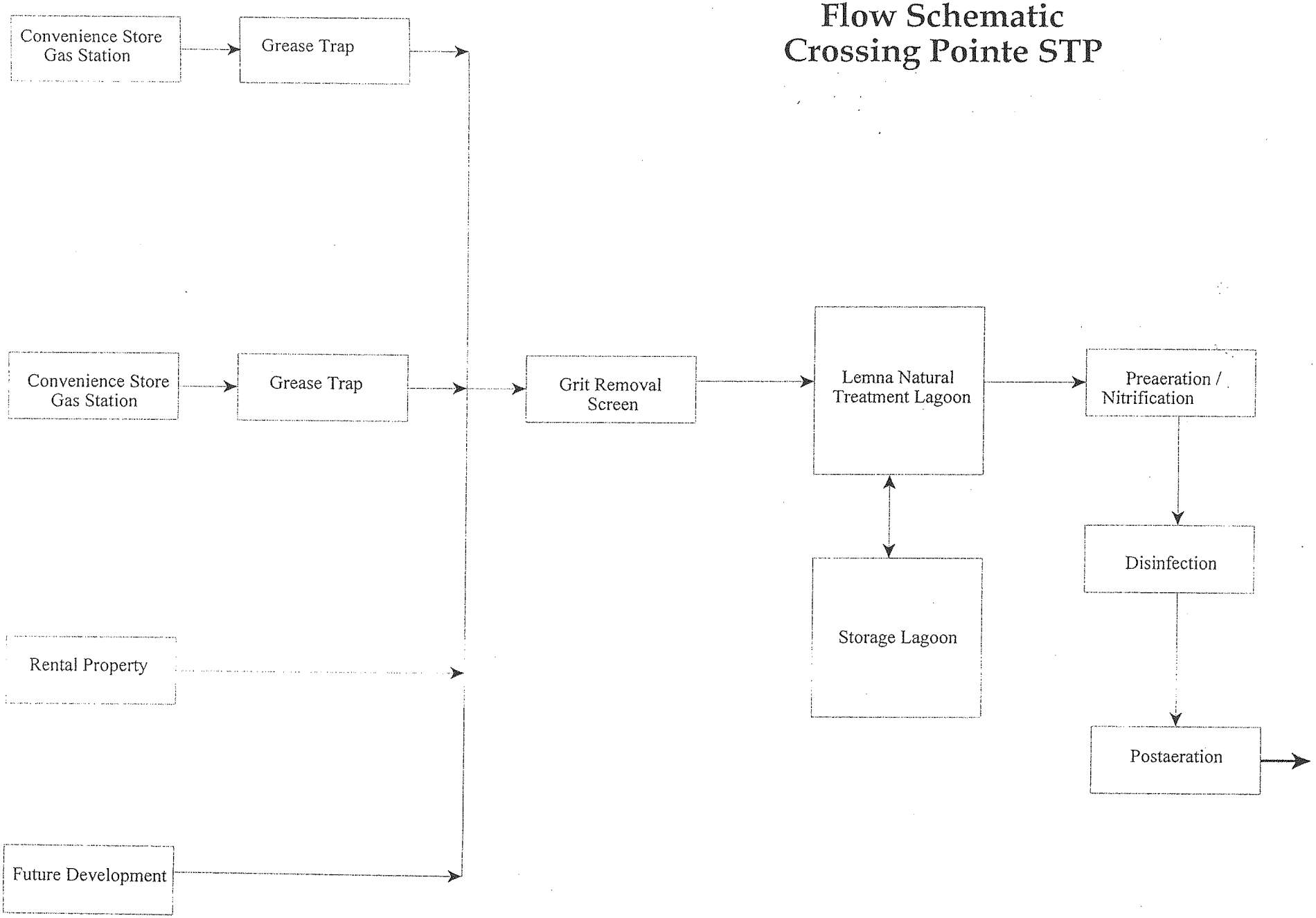
The high flow months are December through May.

If you have any questions concerning this analysis, please let me know.

ATTACHMENT 2

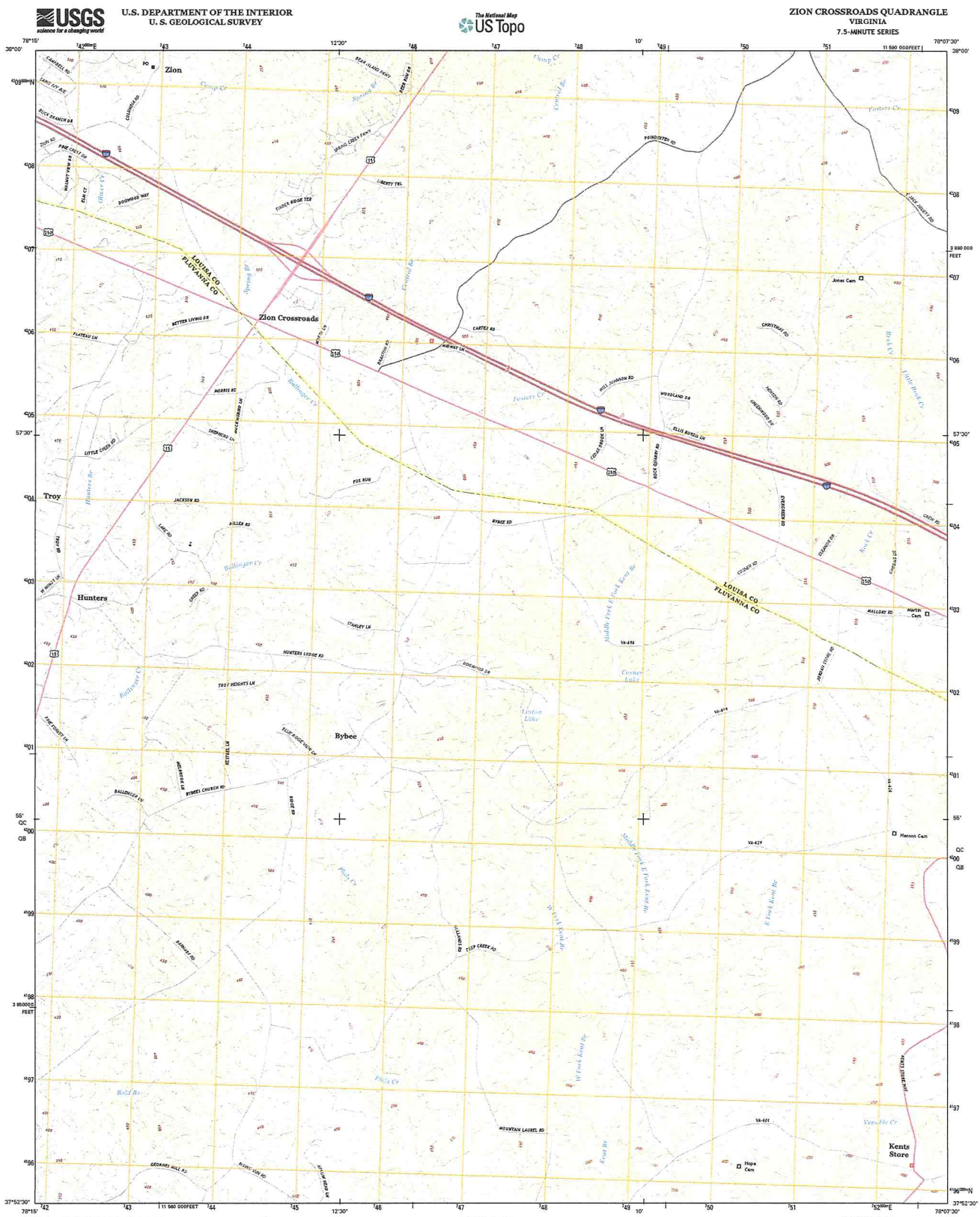
Facility Schematic/Diagram

Flow Schematic
Crossing Pointe STP



ATTACHMENT 3

Topographic Map



U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

USGS science for a changing world

The National Map US Topo

ZION CROSSROADS QUADRANGLE
VIRGINIA
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 17S
10 000-foot ticks: Virginia Coordinate System of 1983 (south zone)

Imagery.....NAIP, May 2012
Roads.....©2006-2012 TomTom
Names.....GNIS, 2013
Hydrography.....National Hydrography Dataset, 2012
Contours.....National Elevation Dataset, 2008
Boundaries.....Census, ISWC, IBC, USGS, 1972 - 2012

UTM GRID AND 2013 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
QC QB
Grid Zone Designation 17S

SCALE 1:24 000

KILOMETERS 0 0.5 1 2
METERS 0 1000 1000 2000
MILES 0 0.5 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.11

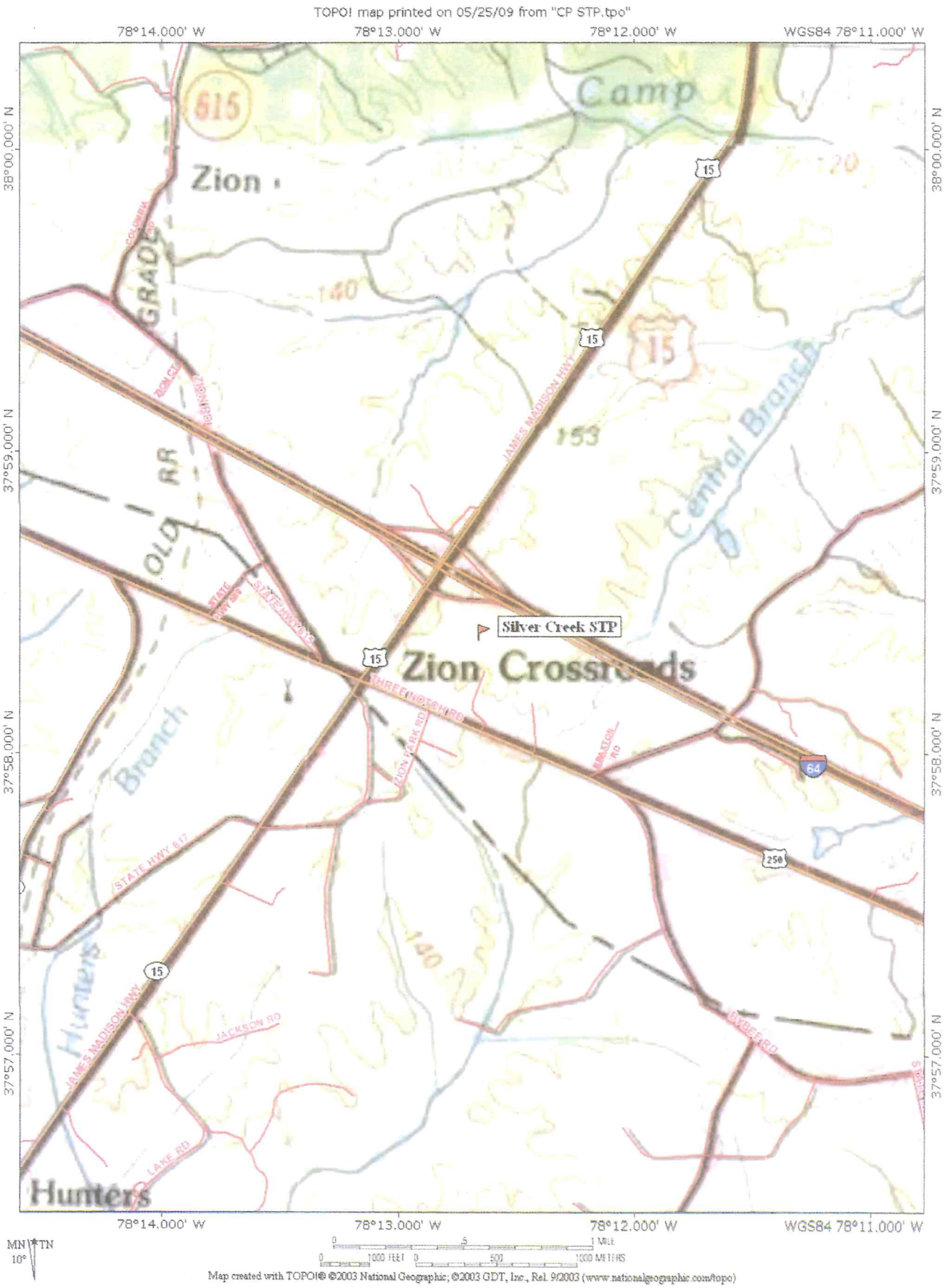
VIRGINIA
QUADRANGLE LOCATION

Keswick	Scottsville Terrace	Louisa
Boyd Tavern	Zion Crossroads	Ferncliff
Palmyra	Columbia	Caledonia

ADJOINING 7.5' QUADRANGLES

ROAD CLASSIFICATION
Expressway — Local Connector
Secondary Hwy — Local Road
Ramp — 4WD
Interstate Route — US Route — State Route

ZION CROSSROADS, VA
2013


TOPO! map printed on 05/25/09 from "CP STP.tpo"
78°14.000' W
78°13.000' W
78°12.000' W
WGS84 78°11.000' W
38°00.000' N
37°59.000' N
37°58.000' N
37°57.000' N
Silver Creek STP
Zion Crossroads
Zion
Camp
Hunters
615
15
64
250
153
140
OLD RR GRADE
Central Branch
Hunters Branch
JAMES MADISON HWY
THREE NOTCH'D RD
ZION PARK RD
JACKSON RD
LAKE RD
STATE HWY 617
MN 10° TN
1 MILE
1000 FEET
500
1000 METERS
Map created with TOPO!® ©2003 National Geographic; ©2003 GDT, Inc., Rel. 9/2003 (www.nationalgeographic.com/topo)

ATTACHMENT 4

Inspection Report

DEQ

WASTEWATER FACILITY INSPECTION REPORT

PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0088706	**December 13, 2004**		**December 12, 2009**

Facility Name	Address	Telephone Number
Virginia Oil – Zion Crossroads STP	**11445 James Madison Highway Zion Crossroads, VA**	**434-531-9114**
Owner Name	Address	Telephone Number
Virginia Oil Company	**P.O. Box 7476 Charlottesville, VA. 22906**	**804-979-1380**
Responsible Official	Title	Telephone Number
William Bush	**CPA, Treasurer, & Secretary**	**434-791-1380**
Responsible Operator	Operator Cert. Class/number	Telephone Number
Fred Kaspick	**Class III; 1911003062**	**434-531-9114**

TYPE OF FACILITY:

DOMESTIC				**INDUSTRIAL**			
Federal		Major		Major		Primary	
Non-federal	**X**	Minor	**X**	Minor		Secondary	

INFLUENT CHARACTERISTICS:	DESIGN:
Flow	**0.0395 MGD**
Population Served	**Variable**
Connections Served	**4**

EFFLUENT LIMITS: Units in mg/L unless otherwise specified

Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.
Flow (MGD)		**NL**	**NA**	**pH (s.u.)**	**6.0**		**9.0**
Total Suspended Solids		**30**	**45**	**Dissolved Oxygen**	**5.0**		
Ammonia-N		**2.1**	**2.1**	**CBOD5**		**15**	**22**
E. coli n/100 ml		**126**					

Receiving Stream	**UT, Central Branch**
Basin	**York River**
Discharge Point (LAT)	**37° 58′ 22″**
Discharge Point (LONG)	**78° 12′ 37″**

VPDES NO. **VA0088706**

REV 5/00

DEQ
WASTEWATER FACILITY
INSPECTION REPORT
PART 1

Inspection date: **July 24, 2007**

Date form completed: **August 10, 2007**

Inspection by: **Sharon Mack**

Inspection agency: **DEQ NRO**

Time spent: **25 hrs**

Announced: **Yes**

Reviewed by:

Scheduled: **Yes**

Present at inspection: **Fred Kaspick - operator**

TYPE OF FACILITY:

	Domestic	**Industrial**	
[ ] Federal	[ ] Major	[ ] Major	[ ] Primary
[X] Nonfederal	[X] Minor	[ ] Minor	[ ] Secondary

Type of inspection:

[X] Routine
[ ] Compliance/Assistance/Complaint
[ ] Reinspection

Date of last inspection: **May 4, 1999**
Agency: **DEQ VRO**

Population served: **Variable**

Connections served: **4**

Last month average: (Effluent) **Month/year: March 2007**

Flow:	**0.0374**	MGD	pH:	**7.87**	s.u.	DO	**5.6**	mg/L
CBOD5	**4.0**	mg/L	TSS	**5.0**	mg/L	Ammonia-N	**0.6**	mg/L
E. coli	**21.7**	n/ 100ml						

Quarter average :(Effluent) **Not possible to calculate- it is generally 3-4 months between discharges.**

DATA VERIFIED IN PREFACE [X] Updated [ ] No changes

Has there been any new construction? [ ] Yes [X] No

If yes, were plans and specifications approved? [ ] Yes [ ] No [X] NA

DEQ approval date: **NA**

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: I Ø II Ø III 1 IV Ø Trainee Ø

2. Hours per day plant is manned: **Fred is generally onsite once weekly. The owner and maintenance employees visit more often, but don't generally record their visits in the operator log (owner will if he makes adjustments or such). Fred on site daily when discharging to keep the balance between the main pond and the surge pond balanced. Plant's preferred discharge rate is 37,000 gpd.**

3. Describe adequacy of staffing. [ ] Good [X] Average [ ] Poor

4. Does the plant have an established program for training personnel? [ ] Yes [X] No

5. Describe the adequacy of the training program. [ ] Good [X] Average [ ] Poor

6. Are preventive maintenance tasks scheduled? [X]Yes [ ] No

7. Describe the adequacy of maintenance. [X] Good [ ] Average [ ] Poor*

8. Does the plant experience any organic/hydraulic overloading?
   If yes, identify cause and impact on plant: [ ] Yes [X] No

9. Any bypassing since last inspection? [ ] Yes [X] No

10. Is the standby electric generator operational? [ ] Yes [ ] No* [X] NA

11. Is the STP alarm system operational? [ ] Yes [ ] No* [X] NA

12. How often is the standby generator exercised? NA
    Power Transfer Switch? NA
    Alarm System? NA

13. When was the cross connection control device last tested on the potable water service? NA

14. Is sludge being disposed in accordance with the approved sludge disposal plan?
    [X] Yes [ ] No [ ] NA

15. Is septage received by the facility? [ ] Yes [X] No
    Is septage loading controlled? [ ] Yes [ ] No [X] NA
    Are records maintained? [ ] Yes [ ] No [X] NA

16. Overall appearance of facility: [X] Good [ ] Average [ ] Poor

Comments:

4. **Fred is a contracted operator, and takes classes on his own.**

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	[X] Yes	[ ] No	[ ] NA
Instrument maintenance and calibration	[X] Yes	[ ] No	[ ] NA
Mechanical equipment maintenance	[X] Yes	[ ] No	[ ] NA
Industrial waste contribution (Municipal Facilities)	[ ] Yes	[ ] No	[X] NA

2. What does the operational log contain?

[X] Visual observations	[X] Flow measurement
[X] Laboratory results	[X] Process adjustments
[ ] Control calculations	[ ] Other (specify)

Comments:

3. What do the mechanical equipment records contain?

[X] As built plans and specs	[ ] Spare parts inventory
[X] Manufacturers instructions	[X] Equipment/parts suppliers
[X] Lubrication schedules	[ ] Other (specify)

Comments:

4. What do the industrial waste contribution records contain? **NA**
(Municipal Only)

[ ] Waste characteristics	[ ] Locations and discharge types
[ ] Impact on plant	[ ] Other (specify)

Comments:

5. Which of the following records are kept at the plant and available to personnel?

[X] Equipment maintenance records	[X] Operational Log
[ ] Industrial contributor records	[X] Instrumentation records
[X] Sampling and testing records	

6. Records not normally available to plant personnel and their location: **NA**

7. Were the records reviewed during the inspection? [X] Yes [ ] No

8. Are the records adequate and the O & M Manual current? [X] Yes [ ] No

9. Are the records maintained for the required 3-year time period? [X] Yes [ ] No

Comments:

3. Spare parts are kept on site but there is no written inventory.

8. O&M manual was last updated in May 2005

(C) SAMPLING

1. Do sampling locations appear to be capable of providing representative samples? [X] Yes [ ] No*
2. Do sample types correspond to those required by the VPDES permit? [X] Yes [ ] No*
3. Do sampling frequencies correspond to those required by the VPDES permit? [X] Yes [ ] No*
4. Are composite samples collected in proportion to flow? [ ] Yes [ ] No* [X] NA
5. Are composite samples refrigerated during collection? [ ] Yes [ ] No* [X] NA
6. Does plant maintain required records of sampling? [X] Yes [ ] No*
7. Does plant run operational control tests? [X] Yes [ ] No

Comments:

(D) TESTING

1. Who performs the testing? [X] Plant [ ] Central Lab [X] Commercial Lab

Name: **Plant- DO and pH**
Aqua-Air Laboratories -- E. coli, CBOD5, TSS, Ammonia-N

If plant performs any testing, complete 2-4.

2. What method is used for chlorine analysis? **NA**
3. Does plant appear to have sufficient equipment to perform required tests? [X] Yes [ ] No*
4. Does testing equipment appear to be clean and/or operable? [ ] Yes [X] No*

Comments:

4. The pH meter was not operating correctly on the date of the inspection. Records showed that it had been calibrated during the last discharge event and unit was in control.

(E) FOR INDUSTRIAL FACILITIES WITH TECHNOLOGY BASED LIMITS ONLY

1. Is the production process as described in the permit application? (If no, describe changes in comments)
   [ ] Yes [ ] No [X] NA
2. Do products and production rates correspond as provided in the permit application? (If no, list differences)
   [ ] Yes [ ] No [X] NA
3. Has the State been notified of the changes and their impact on plant effluent? Date:
   [ ] Yes [ ] No* [X] NA

Comments:

Problems identified at last inspection (May 4, 1999)	Corrected	Not Corrected
1. What looked like a bar screen was sitting inside the control building. I saw no influent bar screen If the unit in the building was the influent bar screen, repair it and replace it.	[ ]	[X]

No bar screen was in place at the influent basin.

SUMMARY

Comments:

- **The facility is located at the intersection of Rt. 15 and I-64.**
- **STP serves the BP gas station and McDonalds, the Exxon gas station and Hardees, the Citgo gas station, and the Dialysis center. The large parking lot behind the BP station also serves as a truck stop.**
- **The Lemna treatment system consists of one large pond divided into 2 halves – an aerated half and an unaerated half that holds the duckweed.**
- **The pond was experiencing an algae bloom that competes w/ duckweed growth – does not appear to affect treatment.**
- **A significant amount of grease was observed floating in the holding/surge pond. Fred commented he had not seen a lot of grease entering the plant and that it may have been coating the sides of the pond and was washed into the water by recent rain.**

Recommendations for action:

- **The influent basin should be cleaned out and the grease disposed of properly. Determine if the restaurants do have grease management plans and, if so, the schedule for cleaning the grease traps.**
- **The bar screen should either be replaced, or the O&M manual amended to reflect that a bar screen is no longer part of the treatment process.**
- **The number for E. coli reported on the March 2007 DMR is the arithmetic mean of the analysis results reported to the facility by the laboratory. While this number was well below the permit limit, E. coli must be reported as a Geometric Mean.**
- **The area where the plant discharge channel meets the stream from the stormwater pond should be made accessible so the channel and junction can be observed and evaluated.**

UNIT PROCESS: Influent basin

- **This is a shallow basin with curved sides that the influent flows through before entering the treatment pond. It is not seen on the facility drawings or mentioned in the O&M Manual.**
- **There was considerable grease build up in the basin. Fred hoses it down occasionally, but it has not been cleaned out to his knowledge.**
- **Water flows through from influent pipe; enters a pipe to pond, which enters pond straight, turns downward, and discharges into the pond near bottom.**
- **Fred measures the water depth and level changes using a staff gage next to the pipe entering the pond.**
- **The O&M manual discusses a manual bar screen and daily maintenance requirements. However, there was not a bar screen in evidence. This was also noted during the technical inspection conducting in May 1999.**

UNIT PROCESS: Ponds/Lagoons - aerated

1.	Type:	[X] Aerated	[ ] Unaerated	[ ] Polishing		
2.	No. of cells:	**3**	In operation:	**3**		
3.	Color:	[X] Green	[ ] Brown	[ ] Light Brown	[ ] Grey	[ ] Other:
4.	Odor:	[ ] Septic*	[X] Earthy	[ ] None	[ ] Other:	
5.	System operated in:	[X] Series	[ ] Parallel	[ ] NA		
6.	If aerated, are lagoon contents mixed adequately?			[X] Yes	[ ] No*	[ ] NA
7.	If aerated, is aeration system operating properly?	[X] Yes		[ ] No*	[ ] NA	

8. Evidence of following problems:

a.	vegetation in lagoon or dikes	[ ] Yes*	[X] No
b.	rodents burrowing on dikes	[ ] Yes*	[X] No
c.	erosion	[X] Yes*	[ ] No
d.	sludge bars	[ ] Yes*	[X] No
e.	excessive foam	[ ] Yes*	[X] No
f.	floating material	[X] Yes*	[ ] No

9.	Fencing intact:	[X] Yes	[ ] No*		
10.	Grass maintained properly:	[X] Yes	[ ] No		
11.	Level control valves working properly:	[X] Yes	[ ] No*		
12.	Effluent discharge elevation:	[ ] Top	[ ] Middle	[ ] Bottom	[X] NA
13.	Freeboard:	**approx 6 ft.**			
14.	Appearance of effluent:	[X] Good	[ ] Fair	[ ] Poor	
15.	General condition:	[X] Good	[ ] Fair	[ ] Poor	
16.	Are monitoring wells present?	[ ] Yes	[X] No		
	Are wells adequately protected from runoff?	[ ] Yes	[ ] No*	[X] NA	
	Are caps on and secured?	[ ] Yes	[ ] No*	[X] NA	

UNIT PROCESS: Ponds/Lagoons – aerated (continued)

Comments:

- **This page refers to the first half of the treatment pond. Air is supplied by two blowers that run alternately.**

2. **This aerated side is divided into three cells by baffle curtains. The influent enters at one end of the pond, and meanders back and forth through openings at alternate ends of the baffle curtains to next cell.**

8c. **For both sides of the pond – the edges are uneven with small eroded areas. These areas may have been caused by geese/ducks entering and exiting water at same spot over the years. One area may contain a burrow.**

8f. **Floating material is algae and duckweed.**

12. **The water passes between the aerated and unaerated (Lemna) sides through an opening in the middle of the final curtain.**

UNIT PROCESS: Ponds/Lagoons - Lemna

1.	Type:	[ ] Aerated	[X] Unaerated	[ ] Polishing	
2.	No. of cells:	**1**	In operation:	**1**	
3.	Color:	[X] Green	[ ] Brown	[ ] Light Brown	[ ] Grey [ ] Other:
4.	Odor:	[ ] Septic*	[ ] Earthy	[X] None	[ ] Other:
5.	System operated in:	[ ] Series	[ ] Parallel	[X] NA	
6.	If aerated, are lagoon contents mixed adequately?			[ ] Yes	[ ] No* [X] NA
7.	If aerated, is aeration system operating properly?	[ ] Yes		[ ] No*	[X] NA

8. Evidence of following problems:

a.	vegetation in lagoon or dikes	[ ] Yes*	[X] No
b.	rodents burrowing on dikes	[ ] Yes*	[X] No
c.	erosion	[X] Yes*	[ ] No
d.	sludge bars	[ ] Yes*	[X] No
e.	excessive foam	[ ] Yes*	[X] No
f.	floating material	[X] Yes*	[ ] No

9.	Fencing intact:	[X] Yes	[ ] No*	
10.	Grass maintained properly:	[X] Yes	[ ] No	
11.	Level control valves working properly:	[X] Yes	[ ] No*	
12.	Effluent discharge elevation:	[X] Top	[ ] Middle	[ ] Bottom
13.	Freeboard:	**approx. 6 ft.**		
14.	Appearance of effluent:	[X] Good	[ ] Fair	[ ] Poor
15.	General condition:	[X] Good	[ ] Fair	[ ] Poor
16.	Are monitoring wells present?	[ ] Yes	[X] No	
	Are wells adequately protected from runoff?	[ ] Yes	[ ] No*	[X] NA
	Are caps on and secured?	[ ] Yes	[ ] No*	[X] NA

Comments:

- **This page refers to the unaerated half of the treatment pond.**

8 c. See comment previous page.

8 f. Floating material is algae and duckweed.

12. The discharge pipe is submerged – the discharge elevation is according to the previous inspection.

UNIT PROCESS: Nitrification tanks

- **The facility has two tanks that are run in parallel.**
- **The tanks are aerated with fine diffusers, supplied by the same blowers that feed the aerated side of treatment pond.**
- **Foam was present, apparently produced by the aeration of the water. Fred said that it is sometimes up to top of tanks.**
- **There are 2 valves on discharge side of the tank- water can be sent either to the holding pond or to the UV system and outfall 001.**
- **For the majority of the time, water is sent to holding pond and recycled back through the system.**

UNIT PROCESS: Ponds/Lagoons –holding pond

1.	Type:	[ ] Aerated	[X] Unaerated	[ ] Polishing	
2.	No. of cells:	**1**	In operation:	**1**	
3.	Color:	[X] Green	[ ] Brown	[ ] Light Brown	[ ] Grey [ ] Other:
4.	Odor:	[ ] Septic*	[ ] Earthy	[X] None	[ ] Other:
5.	System operated in:	[ ] Series	[ ] Parallel	[X] NA	
6.	If aerated, are lagoon contents mixed adequately?			[ ] Yes	[ ] No* [X] NA
7.	If aerated, is aeration system operating properly?	[ ] Yes		[ ] No*	[X] NA

8. Evidence of following problems:

a.	vegetation in lagoon or dikes	[ ] Yes*	[X] No
b.	rodents burrowing on dikes	[ ] Yes*	[X] No
c.	erosion	[ ] Yes*	[X] No
d.	sludge bars	[ ] Yes*	[X] No
e.	excessive foam	[ ] Yes*	[X] No
f.	floating material	[X] Yes*	[ ] No

9.	Fencing intact:	[X] Yes	[ ] No*	
10.	Grass maintained properly:	[X] Yes	[ ] No	
11.	Level control valves working properly:	[X] Yes	[ ] No*	
12.	Effluent discharge elevation:	[ ] Top	[X] Middle	[ ] Bottom
13.	Freeboard:	**6 ft.**		
14.	Appearance of effluent: **See comments**	[ ] Good	[ ] Fair	[ ] Poor
15.	General condition:	[X] Good	[ ] Fair	[ ] Poor
16.	Are monitoring wells present?	[ ] Yes	[X] No	
	Are wells adequately protected from runoff?	[ ] Yes	[ ] No*	[X] NA
	Are caps on and secured?	[ ] Yes	[ ] No*	[X] NA

Comments:

8f. A lot of grease was floating on the water surface.

14. The water in this pond is pumped back into the aerated side of the Lemna pond. The pump is float activated and is kept in auto; levels are set to keep the two ponds in balance. The pump was on while I was on site and the pipe that conveys water from this pond to the Lemna pond was leaking.

VPDES NO. **VA0088706**

UNIT PROCESS: Ultraviolet (UV) Disinfection

1.	Number of UV lamps/assemblies: **3 racks, 2 bulbs each rack**	In operation:	**none- no discharge**	
2.	Type of UV system and design dosage:	**Trojan 3075**		
3.	Proper flow distribution between units:	[ ] Yes	[ ] No*	[X] NA
4.	Method of UV intensity monitoring:	**intensity meters**		
5.	Adequate ventilation of ballast control boxes:	[X] Yes	[ ] No*	[ ] NA
6.	Indication of on/off status of all lamps provided:	[X] Yes	[ ] No*	
7.	Lamp assemblies easily removed for maintenance: [X] Yes	[ ] No*		
8.	Records of lamp operating hours and replacement:	[X] Yes	[ ] No*	
9.	Routine cleaning system provided: Operate properly: Frequency of routine cleaning:	[X] Yes [X] Yes **As needed – see comments**	[ ] No* [ ] No*	
10.	Lamp energy control system operate properly:	[X] Yes	[ ] No*	
11.	Date of last system overhaul:	**See comment for #9 below**		
	a. UV unit completely drained	[ ] Yes	[ ] No*	
	b. all surfaces cleaned	[ ] Yes	[ ] No*	
	c. UV transmissibility checked	[ ] Yes	[ ] No*	
	d. output of selected lamps checked	[ ] Yes	[ ] No*	
	e. output of tested lamps			
	f. total operating hours, oldest lamp/assembly			
	g. number of spare lamps and ballasts available: lamps:		ballasts:	
12.	UV protective eyeglasses provided:	[X] Yes	[ ] No*	
13.	General condition: **See Comments**	[ ] Good	[ ] Fair	[ ] Poor

Comments:

9. System is operated only when there is a discharge to the environment, approximately every 3 months. Bulbs are cleaned as needed, determined by visual inspection, test results, and UV intensity meter readings. All bulbs were changed Spring 2007. Intensity meters used to determine if bulbs dirty or not.

13. We did not go down to inspect system because of a dead fox and resulting funky smell in the hut.

UNIT PROCESS: Post Aeration

1. Number of units: **1** In operation: **1**

2. Proper flow distribution between units: [ ] Yes [ ] No* [**X**] NA

3. Evidence of following problems: **No Discharge during inspection.**
   a. dead spots [ ] Yes* [ ] No
   b. excessive foam [ ] Yes* [ ] No
   c. poor aeration [ ] Yes* [ ] No
   d. mechanical equipment failure [ ] Yes* [ ] No [ ] NA

4. How is the aerator controlled? [ ] Time clock [ ] Manual [**X**] Continuous [ ] Other* [ ] NA

5. What is the current operating schedule? **Plant discharges approx. once every 3 months.**

6. Step weirs level: [**X**] Yes [ ] No [ ] NA

7. Effluent D.O. level: **NA**

8. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

1. **Step aeration**

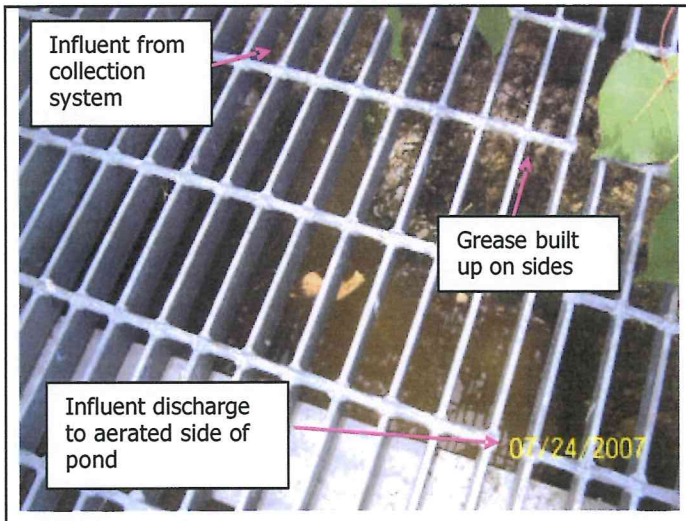
UNIT PROCESS: Effluent/Plant Outfall

1.	Type Outfall	[**X**] Shore based		[ ] Submerged	
2.	Type if shore based:	[**X**] Wingwall		[ ] Headwall	[ ] Rip Rap
3.	Flapper valve:	[ ] Yes	[**X**] No	[ ] NA	
4.	Erosion of bank:	[ ] Yes	[**X**] No	[ ] NA	
5.	Effluent plume visible?	[ ] Yes*	[**X**] No	**No Discharge**	
6.	Condition of outfall and supporting structures:			[ ] Good	[ ] Fair [ ] Poor*
7.	Final effluent, evidence of following problems:			**NA**	
	a. oil sheen	[ ] Yes*	[ ] No		
	b. grease	[ ] Yes*	[ ] No		
	c. sludge bar	[ ] Yes*	[ ] No		
	d. turbid effluent	[ ] Yes*	[ ] No		
	e. visible foam	[ ] Yes*	[ ] No		
	f. unusual color	[ ] Yes*	[ ] No		

Comments:

2. Water from bottom of step aeration structure flows into a rock lined channel that joins the stream below the property's storm water runoff pond, then flows into Central Branch.

6. The area at the bottom of the step aeration structure was overgrown and the rock channel not easily



1) Influent basin.

2) Water level measurement staff at pond influent.

3) Overview of pond showing aerated and Lemna sides.

4) Shoreline of Lemna pond.

5) Eroded area on pond bank.

Facility name: Virginia Oil- Zion Crossroads STP
VPDES Permit No. VA0088706
Site Inspection Date: July 24, 2007
Photos & Layout by: Sharon Mack

7) Eroded area and possible burrow in pond bank.

8) Unaerated side of Lemna pond.

9) Nitrification tanks.

10) UV system.

11) Flow measurement and sample site.

12) Step aeration.

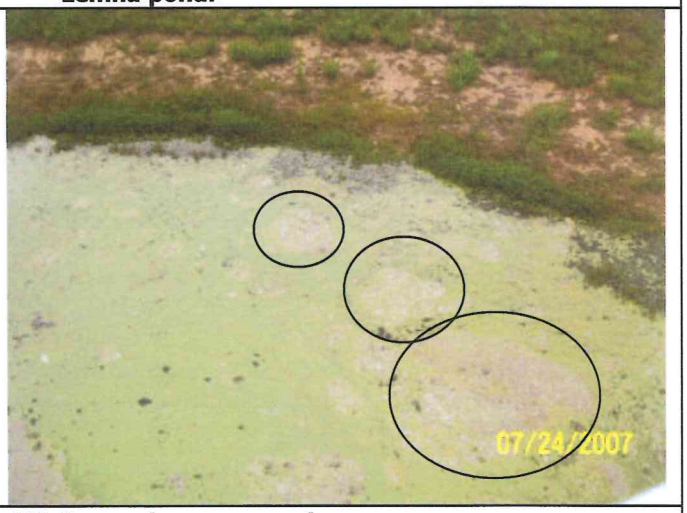
13) Receiving stream.

14) Stormwater holding pond for the property.

15) Holding/surge pond.

16) Controls for pump from surge pond back to Lemna pond.

17) Leak from pipe carrying water from surge pond to aerated pond.



18) Grease in surge pond.

ATTACHMENT 5

Planning Statement

To:	Douglas Frasier
From:	Jennifer Carlson
Date:	5 September 2014
Subject:	Planning Statement for South Creek – Zion Crossroads
Permit Number:	VA0088706

Information for Outfall 001:

Discharge Type:	minor municipal
Discharge Flow:	0.0395 MGD
Receiving Stream:	Central Branch
Latitude / Longitude:	37° 58' 22" / 78° 12' 40"
Rivermile:	3.1
Streamcode:	8-CEN
Waterbody:	VAN-F01R
Water Quality Standards:	Class III, Section 3
Drainage Area:	0.16 square miles

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   This facility discharges into Central Branch, which has not been monitored or assess by DEQ. The nearest downstream DEQ monitoring station is 8-CMP000.28, located at the Route 717 bridge crossing. This station on Camp Creek is located approximately 4.8 miles downstream of Outfall 001. The following is the water quality summary for Camp Creek, as taken from the 2012 Integrated Report:

   Class III, Section 3.

   DEQ monitoring station located in this segment of Camp Creek:
   - *Ambient and biological monitoring station 8-CMP000.28 at Route 717.*

   E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. This impairment is nested within the downstream completed bacteria TMDL for the South Anna River. Biological monitoring finds benthic macroinvertebrate impairments, resulting in an impaired classification for the aquatic life use. The fish consumption and wildlife uses were not assessed.

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

   No.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

Yes.

Table B. Information on Downstream 303(d) Impairments and TMDLs

Waterbody Name	Impaired Use	Cause	Distance From Outfall	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the 2012 Integrated Report							
Camp Creek	Recreation	*E. coli*	4.8 miles	Pamunkey River Basin Bacteria 08/02/2006	6.87E+10 cfu/year *E. coli*	126 cfu/100ml *E. coli* --- 0.0395 MGD	---
	Aquatic Life	Benthic Macroinvertebrates		No	---	---	2024

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

DEQ staff request that the facility perform nutrient monitoring for total phosphorus, nitrate, nitrite, ammonia, and TKN during discharge events from Outfall 001. Nutrient monitoring is requested of facilities that are located within a 5 mile distance upstream of a benthic impairment.

There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

There are no public water supply intakes located within 5 miles of this discharge.

ATTACHMENT 6

Water Quality Criteria / Wasteload Allocation Analysis

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: South Creek - Zion Crossroads Permit No.: VA0088706

Receiving Stream: Central Branch, UT Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	mg/L
90% Temperature (Annual) =	deg C
90% Temperature (Wet season) =	deg C
90% Maximum pH =	SU
10% Maximum pH =	SU
Tier Designation (1 or 2) =	1
Public Water Supply (PWS) Y/N? =	n
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	MGD
7Q10 (Annual) =	MGD
30Q10 (Annual) =	MGD
1Q10 (Wet season) =	MGD
30Q10 (Wet season) =	MGD
30Q5 =	MGD
Harmonic Mean =	MGD

Mixing Information

Annual - 1Q10 Mix =	%
- 7Q10 Mix =	%
- 30Q10 Mix =	%
Wet Season - 1Q10 Mix =	%
- 30Q10 Mix =	%

Effluent Information

Mean Hardness (as CaCO3) =	50 mg/L
90% Temp (Annual) =	25 deg C
90% Temp (Wet season) =	15 deg C
90% Maximum pH =	8.4 SU
10% Maximum pH =	7.5 SU
Discharge Flow =	0.0395 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+02
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	--	--	--	--	na	9.3E+00
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+00
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	3.0E+00	--	na	5.0E-04
Ammonia-N (mg/l) (Yearly)	0	3.88E+00	6.56E-01	na	--	3.88E+00	6.56E-01	na	--	--	--	--	--	--	--	--	--	3.88E+00	6.56E-01	na	--
Ammonia-N (mg/l) (High Flow)	0	3.88E+00	1.25E+00	na	--	3.88E+00	1.25E+00	na	--	--	--	--	--	--	--	--	--	3.88E+00	1.25E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	--	--	na	4.0E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	--	--	--	--	na	6.4E+02
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+02
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-03
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+00
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+01
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
Cadmium	0	1.8E+00	6.6E-01	na	--	1.8E+00	6.6E-01	na	--	--	--	--	--	--	--	--	--	1.8E+00	6.6E-01	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+01
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	8.1E-03
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	**1.3E+02**
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	**1.1E+04**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	**1.6E+03**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	**1.5E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	**8.3E-02**	**4.1E-02**	na	--
Chromium III	0	3.2E+02	4.2E+01	na	--	3.2E+02	4.2E+01	na	--	--	--	--	--	--	--	--	--	**3.2E+02**	**4.2E+01**	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	**1.6E+01**	**1.1E+01**	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	**1.8E-02**
Copper	0	7.0E+00	5.0E+00	na	--	7.0E+00	5.0E+00	na	--	--	--	--	--	--	--	--	--	**7.0E+00**	**5.0E+00**	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	--	--	--	--	--	--	--	--	**2.2E+01**	**5.2E+00**	na	**1.6E+04**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	**3.1E-03**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	**2.2E-03**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	--	--	--	--	--	--	--	--	**1.1E+00**	**1.0E-03**	na	**2.2E-03**
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	**1.0E-01**	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	--	--	**1.7E-01**	**1.7E-01**	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	**1.8E-01**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	**1.3E+03**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	--	--	na	**9.6E+02**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	--	--	na	**1.9E+02**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	**2.8E-01**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	**1.7E+02**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	**3.7E+02**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	--	--	--	--	na	**7.1E+03**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	--	--	na	**1.0E+04**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	--	--	na	**2.9E+02**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	**1.5E+02**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	**2.1E+02**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	--	--	--	--	--	--	--	--	**2.4E-01**	**5.6E-02**	na	**5.4E-04**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	--	--	--	--	na	**4.4E+04**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	--	--	na	**8.5E+02**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	--	--	na	**1.1E+06**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	**4.5E+03**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	**5.3E+03**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	--	--	na	**2.8E+02**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	**3.4E+01**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	--	--	--	--	na	**5.1E-08**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	**2.0E+00**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	na	**8.9E+01**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	na	**8.9E+01**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	**8.9E+01**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	--	--	--	--	--	--	--	--	**8.6E-02**	**3.6E-02**	na	**6.0E-02**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	--	--	--	--	na	**3.0E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	1.4E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	7.9E-04
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	3.9E-04
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-03
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+02
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-02
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	1.8E+00
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+03
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	4.9E+01	5.6E+00	na	--	4.9E+01	5.6E+00	na	--	--	--	--	--	--	--	--	--	4.9E+01	5.6E+00	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	- -	- -	1.4E+00	7.7E-01	- -	- -	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	- -	- -
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	1.0E+02	1.1E+01	na	4.6E+03	1.0E+02	1.1E+01	na	4.6E+03	--	--	--	--	--	--	--	--	1.0E+02	1.1E+01	na	4.6E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	6.9E+02
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+01
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+01
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	na	6.4E-04
Pentachlorophenol [C]	0	1.4E+01	1.1E+01	na	3.0E+01	1.4E+01	1.1E+01	na	3.0E+01	--	--	--	--	--	--	--	--	1.4E+01	1.1E+01	na	3.0E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	8.6E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+00
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**4.2E+03**
Silver	0	1.0E+00	--	na	--	1.0E+00	--	na	--	--	--	--	--	--	--	--	--	**1.0E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+01**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+01**
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E-01**
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.0E+03**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**2.8E-03**
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.0E+01**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+02**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E+02**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
Zinc	0	6.5E+01	6.6E+01	na	2.6E+04	6.5E+01	6.6E+01	na	2.6E+04	--	--	--	--	--	--	--	--	**6.5E+01**	**6.6E+01**	**na**	**2.6E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.4E+02
Arsenic	9.0E+01
Barium	na
Cadmium	3.9E-01
Chromium III	2.5E+01
Chromium VI	6.4E+00
Copper	2.8E+00
Iron	na
Lead	3.4E+00
Manganese	na
Mercury	4.6E-01
Nickel	6.8E+00
Selenium	3.0E+00
Silver	4.2E-01
Zinc	2.6E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

ATTACHMENT 7

April 2010 – June 2014 Effluent Data

DMR QA/QC

Permit #:VA0088706

Facility:South Creek - Zion Crossroads

Rec'd	Parameter Description	QTY AVG	Lim Avg	QTY MAX	Lim Max	CONC MIN	Lim Min	CONC AVG	Lim Avg	CONC MAX	Lim Max
10-May-2010	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	8.1	2.1	8.1	2.1
19-Jun-2011	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.1	2.1	.01	2.1
08-Dec-2011	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.2	2.1	0.2	2.1
07-May-2012	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	3.3	2.1	3.3	2.1
05-Jun-2013	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	18.7	2.1	18.7	2.1
08-Jul-2013	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.2	2.1	0.2	2.1
10-Nov-2013	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	3.8	2.1	3.8	2.1
09-Jun-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.2	2.1	0.2	2.1
09-Jul-2014	AMMONIA, AS N	NULL	*********	NULL	*********	NULL	*********	0.2	2.1	.02	2.1
10-May-2010	CBOD5	2.8	2.2	2.8	3.3	NULL	*********	20.0	15	20.0	22
19-Jun-2011	CBOD5	2.118	2.2	2.118	3.3	NULL	*********	15	15	15	22
08-Dec-2011	CBOD5	0.596	2.2	0.596	3.3	NULL	*********	5.0	15	5.0	22
07-May-2012	CBOD5	0.131	2.2	0.131	3.3	NULL	*********	2.0	15	2.0	22
05-Jun-2013	CBOD5	1.33	2.2	1.33	3.3	NULL	*********	8.0	15	8.0	22
08-Jul-2013	CBOD5	.2	2.2	.2	3.3	NULL	*********	2.0	15	2.0	22
10-Nov-2013	CBOD5	1.3	2.2	1.3	3.3	NULL	*********	9	15	9	22
09-Jun-2014	CBOD5	0.6	2.2	0.6	3.3	NULL	*********	5.0	15	5.0	22
09-Jul-2014	CBOD5	0.2	2.2	.02	3.3	NULL	*********	2.0	15	2.0	22
23-May-2012	CBOD5, INFLUENT	NULL	*********	NULL	*********	NULL	*********	NULL	*********	97	NL
10-May-2010	DO	NULL	*********	NULL	*********	5.1	5.0	NULL	*********	NULL	*********
19-Jun-2011	DO	NULL	*********	NULL	*********	5.0	5.0	NULL	*********	NULL	*********
08-Dec-2011	DO	NULL	*********	NULL	*********	5.5	5.0	NULL	*********	NULL	*********
07-May-2012	DO	NULL	*********	NULL	*********	5.1	5.0	NULL	*********	NULL	*********
05-Jun-2013	DO	NULL	*********	NULL	*********	1.4	5.0	NULL	*********	NULL	*********
08-Jul-2013	DO	NULL	*********	NULL	*********	1.6	5.0	NULL	*********	NULL	*********
10-Nov-2013	DO	NULL	*********	NULL	*********	.8	5.0	NULL	*********	NULL	*********
09-Jun-2014	DO	NULL	*********	NULL	*********	5.0	5.0	NULL	*********	NULL	*********
09-Jul-2014	DO	NULL	*********	NULL	*********	5.1	5.0	NULL	*********	NULL	*********
10-May-2010	E.COLI	NULL	*********	NULL	*********	NULL	*********	35.4	126	NULL	*********
19-Jun-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	121.7	126	NULL	*********
08-Dec-2011	E.COLI	NULL	*********	NULL	*********	NULL	*********	1154	126	NULL	*********

07-May-2012	E.COLI	NULL	*********	NULL	*********	NULL	*********	47.4	126	NULL	*********
05-Jun-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	39.2	126	NULL	*********
08-Jul-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	71.4	126	NULL	*********
10-Nov-2013	E.COLI	NULL	*********	NULL	*********	NULL	*********	52.1	126	NULL	*********
09-Jun-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	206.4	126	NULL	*********
09-Jul-2014	E.COLI	NULL	*********	NULL	*********	NULL	*********	114.4	126	NULL	*********
10-May-2010	FLOW	0.0378	0.0395	0.0438	NL	NULL	*********	NULL	*********	NULL	*********
19-Jun-2011	FLOW	.0356	0.0395	.0438	NL	NULL	*********	NULL	*********	NULL	*********
08-Dec-2011	FLOW	0.0396	0.0395	0.0587	NL	NULL	*********	NULL	*********	NULL	*********
07-May-2012	FLOW	0.0377	0.0395	0.0966	NL	NULL	*********	NULL	*********	NULL	*********
04-Jun-2012	FLOW	NULL	0.0395	NULL	NL	NULL	*********	NULL	*********	NULL	*********
05-Jun-2013	FLOW	0.0391	0.0395	.0509	NL	NULL	*********	NULL	*********	NULL	*********
08-Jul-2013	FLOW	.0392	0.0395	.0510	NL	NULL	*********	NULL	*********	NULL	*********
10-Nov-2013	FLOW	.0394	0.0395	.0762	NL	NULL	*********	NULL	*********	NULL	*********
09-Jun-2014	FLOW	.0387	0.0395	.0587	NL	NULL	*********	NULL	*********	NULL	*********
09-Jul-2014	FLOW	0.0394	0.0395	.0587	NL	NULL	*********	NULL	*********	NULL	*********
10-May-2010	pH	NULL	*********	NULL	*********	7.5	6.0	NULL	*********	8.2	9.0
19-Jun-2011	pH	NULL	********	NULL	********	7.7	6.0	NULL	*********	8.7	8.0
08-Dec-2011	pH	NULL	********	NULL	********	6.3	6.0	NULL	*********	8.5	8.0
07-May-2012	pH	NULL	********	NULL	********	7.9	6.0	NULL	*********	8.2	8.0
05-Jun-2013	pH	NULL	********	NULL	********	8.04	6.0	NULL	*********	8.2	8.0
08-Jul-2013	pH	NULL	********	NULL	********	7.8	6.0	NULL	*********	8.4	8.0
10-Nov-2013	pH	NULL	********	NULL	********	7.5	6.0	NULL	*********	7.7	8.0
09-Jun-2014	pH	NULL	********	NULL	********	7.5	6.0	NULL	*********	8.1	8.0
09-Jul-2014	pH	NULL	********	NULL	********	7.87	6.0	NULL	*********	8.1	8.0
								10th	7.5	90th	8.4
10-May-2010	TSS	0.4	4.5	0.4	6.7	NULL	*********	2.8	30	2.8	45
19-Jun-2011	TSS	5.4	4.5	5.4	6.7	NULL	*********	38.4	30	38.4	45
08-Dec-2011	TSS	4.6	4.5	4.6	6.7	NULL	*********	38.6	30	38.6	45
07-May-2012	TSS	0.144	4.5	0.144	6.7	NULL	*********	2.2	30	2.2	45
05-Jun-2013	TSS	0.68	4.5	0.68	6.7	NULL	*********	4.1	30	4.1	45
08-Jul-2013	TSS	0.26	4.5	0.26	6.7	NULL	*********	2.2	30	2.2	45
10-Nov-2013	TSS	1.41	4.5	1.41	6.7	NULL	*********	10.	30	10.	45
09-Jun-2014	TSS	1.24	4.5	1.24	6.7	NULL	*********	10.4	30	10.4	45
09-Jul-2014	TSS	1.2	4.5	1.2	6.7	NULL	*********	10.2	30	10.2	45
23-May-2012	TSS, INFLUENT	NULL	*********	NULL	*********	NULL	*********	NULL	*********	50.	NL

ATTACHMENT 8

Ammonia Limitation Derivation

9/12/2014 8:58:38 AM

Facility = South Creek - Zion Crossroads
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 3.88
WLAc =
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 3.88
Average Weekly limit = 3.88
Average Monthly LImit = 3.88

The data are:

9

Facility = VA Oil - Zion Crossroads
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 2.2
WLAc = 3.71
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 2.2
Average Weekly limit = 2.2
Average Monthly LImit = 2.2

The data are:

ATTACHMENT 9

August 1994 Stream Model

Evaluation of Conventional Pollutants

The final $cBOD_5$, TKN and D.O. limitations were established by a water quality model which was performed by the permit writer on August 22, 1994. According to the model, the following limits are required to maintain water quality standards in the dry ditch at 0.0395 MGD:

$cBOD_5$ = 15 mg/l
TKN = 5 mg/l
D.O. = 5 mg/l

However, there are no actual TKN limit within the permit. The nitrogen monitoring and limitations lie completely within the proposed ammonia limit

Temperature

No temperature data was available for this facility. The design temperature of 25° C was assumed

****

REGIONAL MODELING SYSTEM VERSION 3.2

****

DEL SIMULATION FOR THE Virginia Oil - Zion Xroads DISCHARGE

TO Central Branch, U.T.

E SIMULATION STARTS AT THE Virginia Oil - Zion Xroads DISCHARGE

********** PROPOSED PERMIT LIMITS **********

OW = .0395 MGD cBOD5 = 15 Mg/L TKN = 5 Mg/L D.O. = 5 Mg/L

** THE MAXIMUM CHLORINE ALLOWABLE IN THE DISCHARGE IS 0.011 Mg/L ****

E SECTION BEING MODELED IS 1 SEGMENT LONG
SULTS WILL BE GIVEN AT 0.1 MILE INTERVALS

********** BACKGROUND CONDITIONS **********

E 7Q10 STREAM FLOW AT THE DISCHARGE IS 0.00000 MGD
E DISSOLVED OXYGEN OF THE STREAM IS 7.386 Mg/L
E BACKGROUND cBODu OF THE STREAM IS 5 Mg/L
E BACKGROUND nBOD OF THE STREAM IS 0 Mg/L

********** MODEL PARAMETERS **********

SEG.	LEN. Mi	VEL. F/S	K2 1/D	K1 1/D	KN 1/D	BENTHIC Mg/L	ELEV. Ft	TEMP. °C	DO-SAT Mg/L
1	1.50	0.352	20.000	1.400	0.450	0.000	440.00	25.00	8.207

he K Rates shown are at 20°C ... the model corrects them for temperature.)

********** RESPONSE FOR SEGMENT 1 **********

TOTAL STREAMFLOW = 0.0395 MGD
(Including Discharge)

DISTANCE FROM HEAD OF SEGMENT (MI.)	TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0.000	0.000	5.000	37.500	8.660
0.100	0.100	5.022	36.371	8.561
0.200	0.200	5.066	35.276	8.464
0.300	0.300	5.124	34.213	8.367
0.400	0.400	5.190	33.183	8.271
0.500	0.500	5.262	32.184	8.177
0.600	0.600	5.336	31.215	8.084
0.700	0.700	5.411	30.275	7.991
0.800	0.800	5.486	29.363	7.900
0.900	0.900	5.561	28.479	7.810
1.000	1.000	5.634	27.622	7.721
1.100	1.100	5.706	26.790	7.633
1.200	1.200	5.776	25.983	7.546
1.300	1.300	5.844	25.201	7.460
1.400	1.400	5.911	24.442	7.375
1.500	1.500	5.975	23.706	7.290

****

GIONAL MODELING SYSTEM Ver 3.2 (OWRM - 9/90)
-30-1994 09:02:54

TA FILE = VOL.MOD

****

REGIONAL MODELING SYSTEM VERSION 3.2

DATA FILE SUMMARY

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E NAME OF THE DATA FILE IS: VOL.MOD

E STREAM NAME IS: Central Branch, U.T.
E RIVER BASIN IS: York
E SECTION NUMBER IS: 3
E CLASSIFICATION IS: III

ANDARDS VIOLATED (Y/N) = N
ANDARDS APPROPRIATE (Y/N) = Y

SCHARGE WITHIN 3 MILES (Y/N) = N

E DISCHARGE BEING MODELED IS: Virginia Oil - Zion Xroads

OPOSED LIMITS ARE:
FLOW = .0395 MGD
BOD5 = 15 MG/L
TKN = 5 MG/L
D.O. = 5 MG/L

E NUMBER OF SEGMENTS TO BE MODELED = 1

10 WILL BE CALCULATED BY: DRAINAGE AREA COMPARISON
THE GAUGE NAME IS: VA #01671500
GAUGE DRAINAGE AREA = 4.4 SQ.MI.
GAUGE 7Q10 = 0 MGD
DRAINAGE AREA AT DISCHARGE = .15 SQ.MI.

REAM A DRY DITCH AT DISCHARGE (Y/N) = Y
TIDEGRADATION APPLIES (Y/N) = N

OCATION DESIGN TEMPERATURE = 25 °C

SEGMENT INFORMATION

SEGMENT # 1

MENT ENDS BECAUSE: THE MODEL ENDS

MENT LENGTH = 1.5 MI

MENT WIDTH = 1 FT
MENT DEPTH = .24 FT
MENT VELOCITY = .25 FT/SEC

INAGE AREA AT SEGMENT START = .15 SQ.MI.
INAGE AREA AT SEGMENT END = 1.4 SQ.MI.

VATION AT UPSTREAM END = 470 FT
VATION AT DOWNSTREAM END = 410 FT

CROSS SECTION IS: IRREGULAR
CHANNEL IS: MODERATELY MEANDERING

LS AND RIFFLES (Y/N) = N

BOTTOM TYPE = GRAVEL
DGE DEPOSITS = NONE
ATIC PLANTS = NONE
AE OBSERVED = NONE
ER COLORED GREEN (Y/N) = N

****

IONAL MODELING SYSTEM Ver 3.2 (OWRM - 9/90)
30-1994 09:04:28

ATTACHMENT 10

Public Notice

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Louisa County, Virginia.

PUBLIC COMMENT PERIOD: TBD, 2014 to TBD, 2014

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: South Creek Farms, LLC/GW & FW Holdings, LLC
11 Perryville Court, Staunton, VA 24401
VA0088706

NAME AND ADDRESS OF FACILITY: South Creek – Zion Crossroads Sewage Treatment Plant
11445 James Madison Highway, Gordonsville, VA 22942

PROJECT DESCRIPTION: South Creek Farms, LLC/GW & FW Holdings, LLC has applied for a reissuance of a permit for the private South Creek – Zion Crossroads Sewage Treatment Plant. The applicant proposes to release treated sewage wastewaters from commercial establishments at a rate of 0.0395 million gallons per day into a water body. There has been no sludge generated from the treatment process. The facility proposes to release the treated sewage in the Central Branch in Louisa County in the York River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, carbonaceous-biochemical oxygen demand-5 day, total suspended solids, dissolved oxygen, ammonia and E. coli. The permit will also require monitoring for total Kjeldahl nitrogen, nitrate+nitrite, total nitrogen and total phosphorus.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, email, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Douglas Frasier
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3873 Email: Douglas.Frasier@deq.virginia.gov Fax: (703) 583-3821